What is claimed is:

5

- 1. A method to increase the liquefaction of mucus or sputum in a patient that has excessively viscous or cohesive mucus or sputum, comprising contacting the mucus or sputum of the patient with a composition comprising a protein or peptide containing a thioredoxin active-site in reduced state effective to increase the liquefaction of the mucus or sputum as compared to prior to the step of contacting.
- 2. The method of Claim 1, wherein the patient has a lung disease in which abnormal or excessive viscosity or cohesiveness of mucus or sputum is a symptom or cause of the disease.
 - 3. The method of Claim 1, wherein the patient has cystic fibrosis.
- 4. The method of Claim 1, wherein the step of contacting the mucus or sputum of the patient with the composition is performed by introducing the composition to the patient by a route selected from the group consisting of nasal, intratracheal, bronchial, direct installation into the lung and inhaled.
- 5. The method of Claim 1, wherein the mucus or sputum to be contacted is located in the respiratory tract, the gastrointestinal tract or the reproductive tract of the patient.
- 6. The method of Claim 1, wherein the composition is administered to the patient in a pharmaceutically acceptable carrier.
- 7. The method of Claim 1, wherein the protein or peptide is administered to the patient in an amount that is between about 1.5 mmoles/kg weight of the patient and about 150 mmoles/kg weight of the patient.
- 8. The method of Claim 1, wherein the protein has a half-life in the patient of between about 5 minutes and about 24 hours.
- 9. The method of Claim 1, wherein a liquid phase of a total volume of a sample of mucus or sputum from the patient shows a statistically significant increase after administration of the composition.

- 10. The method of Claim 1, wherein the thioredoxin active-site comprises the amino acid sequence C-X-X-C, wherein C residues are in reduced state, and wherein X residues are any amino acid residue.
- 11. The method of Claim 1, wherein the thioredoxin active-site comprises the amino acid sequence X-C-X-X-C-X, wherein C residues are in reduced state, and wherein X residues are any amino acid residue.
- 12. The method of Claim 1, wherein the thioredoxin active-site comprises the amino acid sequence X-C-G-P-C-X (SEQ ID NO:2), wherein C residues are in reduced state, and wherein X residues are any amino acid residue.
- 13. The method of Claim 1, wherein the thioredoxin active-site comprises the amino acid sequence W-C-G-P-C-K (SEQ ID NO:3), wherein C residues are in reduced state.
- 14. The method of Claim 1, wherein the protein comprises thioredoxin selected from the group consisting of prokaryotic thioredoxin, yeast thioredoxin, plant thioredoxin, and mammalian thioredoxin.
 - 15. The method of Claim 1, wherein the protein comprises human thioredoxin.
- 16. The method of Claim 1, wherein the composition further comprises nicotinamide-adenine dinucleotide phosphate (reduced form) (NADPH) for reducing the thioredoxin active site of the protein.
- 17. The method of Claim 16, wherein the composition further comprises thioredoxin reductase.

- 18. A composition for use in the liquefaction of mucus or sputum, comprising a protein or peptide containing a thioredoxin active-site in reduced state and at least one additional agent for treatment of excessively viscous or cohesive mucus or sputum.
- 19. The composition of Claim 18, wherein the thioredoxin active-site comprises the amino acid sequence X-C-X-X-C-X, wherein C residues are in reduced state, and wherein the X residues are any amino acid residue.
- 20. The composition of Claim 18, wherein the thioredoxin active-site comprises the amino acid sequence X-C-G-P-C-X (SEQ ID NO:2), wherein C residues are in reduced state, and wherein the X residues are any amino acid residue.
- 21. The composition of Claim 18, wherein the thioredoxin active-site comprises the amino acid sequence W-C-G-P-C-K (SEQ ID NO:3), wherein C residues are in reduced state.
- 22. The composition of Claim 18, wherein the protein comprises thioredoxin selected from a group consisting of prokaryotic thioredoxin, yeast thioredoxin, plant thioredoxin, and mammalian thioredoxin.
- 23. The composition of Claim 18, wherein the protein comprises human thioredoxin.
- 24. The composition of Claim 18, wherein the composition further comprises nicotinamide-adenine dinucleotide phosphate (reduced form) (NADPH).
- 25. The composition of Claim 24, wherein the composition further comprises thioredoxin reductase.

26. A method to increase the liquefaction of mucus or sputum in a patient that has excessively viscous or cohesive mucus or sputum, comprising contacting the mucus or sputum in the respiratory tract of the patient with a composition comprising a protein comprising the amino acid sequence X-C-X-X-C-X, wherein C residues are in reduced state, wherein the contact of composition increases the volume of the liquid phase in a sample of mucus or sputum from the patient as compared to prior to contact with the composition.